



Utah!

Where ideas connect

Department of Environmental Quality
Division of Water Quality

Michael O. Leavitt
Governor
Dianne R. Nielson, Ph.D.
Executive Director
Don A. Ostler, P.E.
Director

288 North 1460 West
P.O. Box 144870
Salt Lake City, Utah 84114-4870
(801) 538-6146
(801) 538-6016 Fax
(801) 536-4414 T.D.D.
www.deq.utah.gov

Water Quality Board

m/035/009
K.C. Shaw, P.E.
Chairman
William R. Williams
Vice-Chairman
Robert G. Adams
Nan Bunker
Ray M. Child, C.P.A.
Neil K. Kochenour, M.D.
Dianne R. Nielson, Ph.D.
Ronald Sims, Ph.D.
Douglas E. Thompson, Mayor
J. Ann Wechsler
Don A. Ostler, P.E.
Executive Secretary

March 12, 2003

Ray Gottling
Kennecott Barneys Canyon Mining Company
8200 South 9600 West
P.O. Box 311
Bingham Canyon, Utah 84006-0311

Subject: Draft Groundwater Permit Renewal, Ground Water Discharge Permit UGW350001.

Dear Mr. Gottling:

Enclosed please find a draft copy of the revised Barney's Canyon permit for your review. This draft is based on the permit renewal application and information sent to the Division on November 13, 2002. The only changes to the permit are minor modifications based on an update of current activities at the mine, most notably including the cessation of active mining at the site. The Division has also received the current version of the Barney's Canyon Mine Reclamation Plan and is currently reviewing this document with the Division of Oil, Gas and Mining. It is likely that a meeting will be necessary in the future with KUC and DOGM to finalize the reclamation plan. Please provide to us any comments on the enclosed permit draft at your earliest convenience. Following the review of your comments the Division will public notice the draft for the required 30 days. Should you have any questions on the permit or related items, please feel free to contact Dan Hall at 538-6146. Thank you for your cooperation in this effort.

Sincerely,

Dennis Frederick
Groundwater Section Manager

DF:DH\bjr

Enclosure:

cc: Salt Lake Valley Health Dept.
Wayne Hedberg, Division of Oil, Gas and Mining

F:\WP\KENNECOTT\BARNEY'S CANYON\BARNEY'S RENEWAL COMP REVIEW 3-03.DOC
FILE:BARNEYS CANYON

RECEIVED

MAR 14 2003

DIV. OF OIL, GAS & MINING

STATEMENT OF BASIS

Heap Leach Operation

DRAFT

KENNECOTT BARNEYS CANYON MINING CO.

P.O. Box 311

Bingham Canyon, Utah 84006-0311

I. DESCRIPTION OF FACILITY

Barneys Canyon Mine operates a cyanide gold leaching facility west of Salt Lake City about two miles north of Copperton, Utah, on the east flank of the Oquirrh Mountains. Mining operations ceased in 2001, but ore on the heap leach pads is still being actively leached for gold recovery. Reclamation of the oxide waste rock dumps and the sulfide waste rock repositories will be largely completed by the end of 2002. A small stockpile of sulfide ore also remains on site above the crusher and will be used as a smelter flux material. The stockpile contains less than 200,000 tons of material and covers less than 6 acres. The site is an east sloping alluvial apron at an elevation of about 5,500 feet and precipitation is light.

The leach pads, processing ponds, processing plants, pits, waste rock dumps and ancillary facilities are operated under the concept that there is no intentional direct discharge to waters of the State. All process fluids are recirculated to the distribution system atop the leach pads.

Gold ore on the leach pad is leached with a high pH solution containing NaCN. The high pH is maintained by additions of NaOH. Cyanide solution containing gold is collected at the base of the heap pad and piped to and stored in a pregnant pond. The solution is pumped from the pregnant pond to the processing plant where the gold is removed by a carbon adsorption process and the remaining solution flows by gravity to the barren ponds. Additional NaOH and cyanide are added to the solution stored in the barren ponds and pumped to the distribution system atop the heap pads. Additional water is added at this point to make up for the water lost by evaporation.

A. DESCRIPTION OF LEACH SOLUTION

The leach solution generally contains about 0.3 pounds of caustic soda (NaOH) per thousand gallons of water and 0.1 to 0.6 pounds sodium cyanide (NaCN) per ton of water. The solution equivalent is about 50 ppm to 300 ppm NaCN. The solution is pumped in pipes to the top of a leach pad where it is distributed at the rate of about 3 to 6 gallons per day per square foot. NaOH is used to maintain a pH greater than 10, in order to keep the NaCN in solution. The chemical composition of the process solutions varies as they move through different stages of the gold extraction process.

At all stages of the process, the solutions have high sulfate content, generally greater than 2000 mg/l. Metals listed in Table 1 of the Ground Water Protection Regulations are present at low to moderate concentrations, generally below 20 mg/l.

B. DESCRIPTION OF PROCESS FLUID CONTROL TECHNOLOGY AND LEAK DETECTION SYSTEM

Each leach pad consists of several cells. The leach pad's vertical configuration starting at the top consists of several layers:

1. Three to five foot thick process solution collection system of fine grained ore, with head less than 12 inches.
2. Sixty mil HDPE primary liner.
3. Twelve inch minimum secondary soil liner having a hydraulic conductivity of 1.0×10^{-7} cm/sec or less.
4. Below the clay, a 6-inch leak detection media having a hydraulic conductivity of 1.0×10^{-3} cm/sec or higher. At the bottom of the media, slotted sloping PVC leak detection pipes have been installed.
5. Six inch minimum engineered secondary soil liner having a hydraulic conductivity of 1.0×10^{-6} cm/sec or less.

In the event of a break in the HDPE liner, and if fluids are able to migrate through the clay liners and the permeable medium, they will flow through the PVC pipe into sumps or ports where they will be detected. The pad or sections of the pads where the break occurred can then be shut down. A verified leak of process water beneath the pads constitutes a failure of the best available technology (BAT).

The leak detection system for the ponds built under the March 24, 1989 construction permit is as follows:

1. 60 mil HDPE primary line;
2. 1 pm per foot HDPE drainage net;
3. 8 oz. per square yard geotextile;
4. 12 inches of 1.0×10^{-7} centimeters per second clay.

A verified leak of process water beneath the pads constitutes a failure of the best available technology (BAT).

The leak detection system for the ponds built under the August 2, 1995 construction permit is as follows:

1. 60 mil HDPE liner;
2. drain net with a transmissivity of 10 gal/min/ft.;
3. 60 mil HDPE liner;
4. 12 inches of 1.0×10^{-7} centimeters per second clay.

The allowable leakage rate of 200 gallons per acre per day is a BAT performance standard for these ponds.

C. DESCRIPTION OF GEOLOGY

The leach site is located on the east flank of the Oquirrh Mountains on the surface of an old east dipping alluvial fan. The fan deposit ranges from 100 to 200 feet thick and consists of sand, gravel and clay. Volcanic rocks underlie the alluvial material. These rocks consist of agglomerates, mudflow deposits and lava flows, and are probably less permeable than the overlying alluvium. The water table slopes downward to the east, and according to data from the monitoring wells ranges from 82 to 380 feet in depth. The site is, therefore, part of the recharge area for the aquifers in the Salt Lake Valley. A production well (BC-280) for the site obtains about 280 to 300 gpm.

II. CLASSIFICATION OF GROUND WATER

Based on monitoring done for the permit to date, ground water in the mine area is classified as Class II. On the basis of sampling done since the permit was originally issued, background water quality, protection levels and out-of-compliance levels have been revised. The protection levels at the site for total dissolved solids are 1.25 times the background value. When a contaminant is present in a detectable amount in the background concentration, the concentration of the pollutant may not exceed 1.25 times the background concentration, or exceed 0.25 times the ground water quality standard, whichever is greater. When a contaminant is not present in a detectable amount, the concentration of the pollutant may not exceed 0.25 times the ground water quality standard, or exceed the limit of detection, whichever is greater.

III. PERMIT CONDITIONS

- A. To maintain compliance with Ground Water Protection levels, best available treatment technology is used. This requires no discharge of process fluids from the facility to ground water. Well monitoring is required to demonstrate that compliance with ground water protection levels is being maintained. Maintenance of BAT will be demonstrated by the absence of process fluids in leak detection sumps of pads and ponds.

A closure document shall be submitted for review and approval twelve (12) months prior to the end of the operational term of any heap leach pads in the project. The heap leach pads are estimated to have approximately 3-5 years of available leaching life remaining, depending on economic conditions. **In no case shall the closure criteria for this heap leach project result in exceedance of ground water compliance levels for this site or degradation of beneficial uses of ground or surface water in the vicinity.**

Leach pads and waste rock dumps must be reclaimed in such a way that ground water pollution is prevented. Any ore heap closure scenario that envisions the release of contact water to the environment will require that the approved water quality criteria be met for three consecutive monthly samples before contact water release can occur. The sampling procedure must be submitted in the closure plan for review and approval.

The oxide waste rock dumps and the sulfide waste rock repositories must be reclaimed according to the approved Waste Rock Management Plan (Appendix A).

- B. Leak Detection System--Monitoring

All leak detection sumps, pipes and ponds are to be monitored daily during use of the heap leach pads to demonstrate that best available technology performance is maintained. In the event that a verified leak is detected beneath the pads or ponds, it is to be reported by telephone within 24 hours and in writing within 5 days to the Division of Water Quality (DWQ).

- C. New Construction

A construction permit must be obtained from DWQ for construction of any new facilities which may cause a discharge of pollutants to waters of the state, or modification of any existing permitted facilities. Such construction may also require modification of this permit.

D. Ground Water Compliance Monitoring

Upgradient monitor wells BCG-280 and BCG-281 are to be sampled twice yearly and the downgradient wells quarterly. Ground water quality protection levels described in the permit will be used to make any determinations of possible out of compliance. Water quality data are to be collected and reported to the DWQ on a quarterly basis. In the event that a compliance level is exceeded, corrective and remedial action will be determined by the company and the DWQ. As a result of detection of cyanide in monitor well BCG-848, the permittee conducted an investigation which involved drilling four new monitor wells. These wells will be included in this renewed permit as points of compliance.

Under the renewed permit, monitoring will be for parameters which are indicative of a release of process waters. These parameters include major ions, which are present in different proportions in the ground water as compared to the process solutions; cyanide, which is a synthetic chemical present in the process solutions but not naturally present in the ground water; and nitrate, a degradation product of cyanide. Analysis for major ions also includes sulfate, which is present in high concentrations in the process water solutions. Most of these parameters are highly mobile in ground water and should result in early detection of a release of process waters. If monitoring for these parameters reveals leakage from the mine facilities, the permittee must monitor for other contaminants which may have been released as part of a Contaminant Investigation as required under R317-6-6.15.

E. Mine Pit Water

Water from mine pits at this site, after primary sediment treatment, may be used for dust suppression, process operations or piped for use to the Copperton concentrator. Other use or disposal will require approval from the Division of Water Quality.

Permit No.: UGW350001

STATE OF UTAH
DIVISION OF WATER QUALITY
UTAH WATER QUALITY BOARD
SALT LAKE CITY, UTAH 84114-4870

DRAFT

GROUND WATER DISCHARGE PERMIT

In compliance with the provisions of the Utah Water Quality Act, Title 19, Chapter 5, Utah Code Annotated 1953, as amended, the Act,

**Kennecott Barneys Canyon Mining Company
P.O. Box 311
Bingham Canyon, Utah 84006-0311**

is granted a ground water discharge permit for the operation of the Barneys Canyon Mine and Cyanide Heap Leach Facility located at Barneys Canyon about 2 miles north of Copperton, Utah. The facility is located about 10 miles southwest of Salt Lake City on the USGS quadrangle of Bingham Canyon, Utah. The property is primarily on Section 31, Township 2 South, Range 2 West, Sections 35 and 36, Township 2 South Range 3 West; and Sections 2 and 3, Township 3 South, Range 3 West, Salt Lake Base and Meridian.

The permit is a renewal of the original ground water discharge permit issued April 9, 1993 and amended September 1, 1995. The permit was renewed in April of 1998, and amended on March 1, 2000. The permit covers existing facilities, mining activities and reclamation at the mine site.

The permit is based on representations made by the permittee and other information contained in the administrative record. It is the responsibility of the permittee to read and understand all provisions of this permit.

The facility shall be constructed and operated in accordance with conditions set forth in the permit and the Utah Ground Water Quality Protection Regulations.

This permit shall become effective_____.

This permit shall expire_____.

Executive Secretary
Division of Water Quality

TABLE OF CONTENTS

CONTENTS

PAGE

PART I. SPECIFIC PERMIT CONDITIONS	1
A. GROUND WATER CLASSIFICATION	1
B. GROUND WATER STANDARDS AND PROTECTION LEVELS.....	1
C. PERMITTED FACILITIES	2
D. COMPLIANCE MONITORING.....	8
E. REPORTING REQUIREMENTS	11
F. OUT OF COMPLIANCE STATUS.....	12
G. CLOSURE REQUIREMENTS.....	14
H. MINE WATER USE	14
PART II. MONITORING, RECORDING AND REPORTING REQUIREMENTS	15
A. REPRESENTATIVE SAMPLING.....	15
B. ANALYTICAL PROCEDURES.....	15
C. PENALTIES FOR TAMPERING	15
D. REPORTING OF MONITORING RESULTS	15
E. COMPLIANCE SCHEDULES	15
F. ADDITIONAL MONITORING BY THE PERMITTEE.....	15
G. RECORDS CONTENTS	15
H. RETENTION OF RECORDS	16
I. TWENTY-FOUR HOUR NOTICE OF NON-COMPLIANCE REPORTING	16
J. OTHER NON-COMPLIANCE REPORTING.....	16
K. INSPECTION AND ENTRY	16
PART III. COMPLIANCE RESPONSIBILITIES	17
A. DUTY TO COMPLY	17
B. PENALTIES FOR VIOLATIONS OF PERMIT CONDITIONS.....	17
C. NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE	17
D. DUTY TO MITIGATE	17
E. PROPER OPERATION AND MAINTENANCE	17
F. UNFORESEEN EVENTS.....	17
PART IV. GENERAL REQUIREMENTS	18
A. PLANNED CHANGES.....	18
B. ANTICIPATED NON-COMPLIANCE	18
C. PERMIT ACTIONS	18
D. DUTY TO REAPPLY	18
E. DUTY TO PROVIDE INFORMATION	18
F. OTHER INFORMATION.....	18
G. SIGNATORY REQUIREMENTS.....	18
H. PENALTIES FOR FALSIFICATION OF REPORTS	19
I. AVAILABILITY OF REPORTS	19
J. PROPERTY RIGHTS.....	20
K. SEVERABILITY	20
L. TRANSFERS.....	20
M. STATE LAWS	20
N. REOPENER PROVISIONS.....	20

PART I. SPECIFIC PERMIT CONDITIONS

- A. **GROUND WATER CLASSIFICATION.** The ground water classification is a Class II Drinking Water Quality Ground Water within the facility boundary, based on well samples from monitor wells at the site. Background ground water quality is summarized in Tables 1 and 2. All parameters in Tables 1 through 4 are in units of mg/l dissolved, except for pH.
- B. **GROUND WATER STANDARDS AND PROTECTION LEVELS.** Based on samples from the facility monitoring wells, the ground water standards and protection levels for the required parameters are listed in Tables 3 and 4.
1. **Ground Water Standards -** The permittee shall comply with all the ground water standards contained in Utah's Ground Water Quality Protection Regulations (R317-6). The ground water around the site must meet the applicable protection level for each of the standards contained in R317-6-2 even though this permit does not require monitoring for each specific chemical listed in the regulations. Therefore, the permittee shall not contaminate ground water by discharging compounds such as metals, leachates, acid, pesticides or volatile organic compounds not listed in the permit.
 2. **Protection Levels -** The protection levels listed in Tables 3 and 4 are based on compounds that may be in the discharge to the ground water, and must be met at the down gradient wells. Monitoring of ground water will be used to demonstrate that protection levels in wells have not been exceeded.
 3. **Exceedance of Protection Levels -** Out-of-compliance will be determined in accordance with Utah Admin. Code R317-6-6.16. Out-of-compliance exists when two (2) consecutive samples from a compliance monitoring well exceed the permit limit and the mean by two standard deviations, as calculated from the background data set for that well.

C. PERMITTED FACILITIES.

1. Leach Pads - Design and construction of existing pads BC-1, BC-2, BC-3, BC-4 and BC-5 incorporated Best Available Technology at the time. They were built as designed according to the construction permit issued March 24, 1989 with a liner system as follows:
 - a. Three to five foot thick solution collection system of fine grained ore, with head less than 12 inches.
 - b. 60 mil HDPE primary liner.
 - c. Twelve inch minimum secondary clay liner having a hydraulic conductivity of 1.0×10^{-7} cm/sec or less.
 - d. Below the clay, a 6-inch leak detection media having a hydraulic conductivity of 1.0×10^{-3} cm/sec or more was built. At the bottom of the media, slotted sloping PVC leak detection pipes were installed to drain to a sump or port that can be monitored by instruments or visually inspected.
 - e. Six inch minimum engineered secondary clay liner having a hydraulic conductivity of 1.0×10^{-6} cm/sec or less.
2. Process Water Ponds - Two process ponds with a total capacity of 10,800,000 gallons were built and designed according to the construction permit issued March 24, 1989. They incorporated Best Available Technology and have a liner system as follows:
 - a. 60 mil HDPE primary line
 - b. 1 pm per foot HDPE drainage net
 - c. 8 oz. per square yard geotextile
 - d. 12 inches of 1.0×10^{-7} centimeters per second clay

The bottom of each pond is graded to one corner where a leak detection sump is located. An 8 inch standpipe is installed to the sump, which allows the entrance of a probe, or portable pump.

A process pond with a total capacity of 4,300,000 gallons has been built west of the existing process ponds described above, under a construction permit dated August 2, 1995. The pond incorporates Best Available Technology and has a liner system as follows:

- a. 60 mil HDPE liner
- b. drain net with a transmissivity of 10 gal/min/ft.
- c. 60 mil HDPE liner
- d. 12 inches of 1.0×10^{-7} centimeters per second clay

A leak detection system with a double lined sump and an eight inch standpipe, similar to the system for the previous ponds, is constructed to the drain net. The allowable leakage rate of 200 gallons per acre per day is a BAT performance standard.

A holding tank for liquid cyanide has been constructed within the pond area to receive cyanide from tanker trucks, under the construction permit of August 2, 1995. The holding tank has been built on a pad with overlying liners that will drain to the ponds in the event of spillage.

3. Future Construction

The permittee must obtain a construction permit from the Division of Water Quality before construction may begin on any new facilities which may cause a discharge of pollutants to waters of the state. Depending on the nature of these facilities, modification of this ground water discharge permit may also be required.

Any revisions or modifications to the approved plans and specifications for existing facilities must be submitted to the Division of Water Quality for review and approval, before construction or implementation thereof.

	BCG 280	BCG 281	BCG 282	BCG 283	BCG 284	BCG 285	BCG 31	BCG 848	BCG 849	BCG 496
TDS	754	687	814	804	655	536	572	811	1080	1045
Nitrate	<0.05	0.78	1.5	1.3	1.1	0.21	0.96	1.5	0.18	0.18
Sulfate	128	36	66	30	35	29	63	107	123	133
Cyanide am-chlor	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004	<0.004
Cadmium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Copper	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
Lead	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.001	<0.05	<0.05	<0.05
Mercury	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005	<0.0005
Selenium	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Silver	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
PH	7.03	7.34	7.36	7.35	7.35	7.38	7.36	7.29	7.16	7.52

Table 1. Background water quality at monitoring wells, units in mg/l except for pH

Well No.	BCG 850	BCG 851A	BCG 851B	BCG 852
TDS	894	921	702	580
Nitrate	4	0.8	0.4	1.4
Sulfate	46	135	91	25
Cyanide am-chlor	<0.004	<0.004	<0.004	<0.004
Cadmium	<0.01	<0.01	<0.01	<0.01
Chromium	<0.05	<0.05	<0.05	<0.05
Copper	<0.05	<0.05	<0.05	<0.05
Lead	<0.05	<0.05	<0.05	<0.05
Mercury	<0.0005	<0.0005	<0.0005	<0.0005
Selenium	<0.01	<0.01	<0.01	<0.01
Silver	<0.01	<0.01	<0.01	<0.01
pH	7.42	7.47	7.39	7.51
<p>Table 2. Background water quality in monitor wells, units in mg/l except for pH.</p>				

	G.W. Standard	BCG-282 a b		BCG-283 a b		BCG-284 a b		BCG-285 a b		BCG-31 a b		BCG-848 a b		BCG-849 a b		BCG-496 a b	
TDS		1018	1018	1006	1192	819	819	671	671	756	756	1014	1014	1350	1508	1307	1307
Nitrate	10	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5	2.5
Cyanide am - chlor	0.2	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Cadmium	0.005	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
Chromium	0.1	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025
Copper	1.3	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
Lead	0.015	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Mercury	0.002	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
Selenium	0.05	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012	0.012
Silver	0.1	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025
pH	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5

Table 3. Protection and Out-of-Compliance Levels for Monitor Wells.

- a. Protection level
b. Out-of-compliance level; greater of protection level or [mean + (2 x standard deviation)]

350001

	BCG a	850 b	BCG A	851A b	BCG a	851B b	BCG b	852 b
TDS	117	1313	1151	1190	878	878	725	725
NITRATE	5.0	8.7	2.5	2.5	2.5	2.5	2.5	2.5
CYANIDE am-chlor.	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
CADMIUM	0.01	0.01	0.01	0.01	0.01	0.01	0.01	0.01
CHROMIUM	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025
COPPER	0.33	0.33	0.33	0.33	0.33	0.33	0.33	0.33
LEAD	0.05	0.05	0.05	0.05	0.05	0.05	0.05	0.05
MERCURY	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005	0.0005
SELENIUM	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025
SILVER	0.025	0.025	0.025	0.025	0.025	0.025	0.025	0.025
pH	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5	6.5-8.5

Table 4. Protection and Out-of-Compliance Levels for Monitor Wells

- a. Protection Level
- b. Out-of-Compliance Level; greater of protection level or
[mean+(2xstandard deviation)]

D. COMPLIANCE MONITORING.

During the period beginning with the effective date of the permit and lasting the term of the permit or as stated in an approved closure plan, the permittee shall demonstrate maintenance of Best Available Technology (BAT) and demonstrate that ground water protection levels have not been exceeded.

1. Ground Water Monitoring - The wells listed in Table 5 shall be monitored to demonstrate compliance with Part I. B.

Table 5--Monitoring Wells Located with Kennecott Coordinate System

Well Number	Northing	Easting	elevation (top of casing)	screened depth	gravel pack depth
Upgradient Wells					
Potable well BCG-280	N31350	E9710	6229	420-930	384-1010
BCG281	N31733	E9976	6172	157-197	134-197
Existing Downgradient Compliance Monitoring Wells					
BCG282	N31929	E16958	5528	155-205	146-205
BCG283	N30463	E17248	5577	176-226	164-229
BCG284	N28189	E16954	5578	418-468	409-469
BCG285	N29480	E14795	5770	81-131	72-132
BC-31 (Copperton)	N27100	E20100	5368	149-1218	--
BCG848	N30090	E17070	5541	132-172	119-200
BCG849	N30546	E13745	5753	206-226	195-226
BCG496	N31224	E16854	5548	206-226	195-226
New Downgradient Compliance Monitoring Wells					
BC850	N28352	E17095	5551	205-245	200-253
BC851A	N30161	E18064	5454	58-78	52-78
BC851B	N30158	E18061	5453	120-160	115-164
BC852	N28367	E18240	5543	160-200	155-206

Procedures for Well Monitoring.

a) Routine Monitoring

All monitor wells shall be analyzed for the following parameters:

Field Parameters: pH, conductivity, temperature, ground water elevation.

Laboratory Parameters: total dissolved solids, major ions (Na, Ca, K, Mg, Cl, SO₄, HCO₃, CO₃), nitrate, and either cyanide (total) or cyanide amenable to chlorination.

- b) In order to demonstrate compliance with the standard for cyanide amenable to chlorination, the permittee may analyze for total cyanide as long as total cyanide is less than the protection standard. If total cyanide exceeds the protection standard in a well, the permittee shall analyze for cyanide amenable to chlorination for that well.

c) Accelerated Background Monitoring

Any new monitor wells which may be required by the Executive Secretary during the term of this permit shall be sampled at least eight times over a one-year or longer time span for all the parameters listed in (a) above, and the following dissolved metals: Pb, Hg, Se, Ag, Cu, Cd, Cr, Zn, Ba, As. Data from background sampling shall be used to establish background concentrations of these constituents and also protection levels.

d) Frequency

Upgradient wells (BCG-280 and BCG-281) are to be sampled twice yearly. The remaining, downgradient wells shall be sampled quarterly. Ground water elevations shall be measured in all monitor wells quarterly.

e) Sampling

Sampling shall be conducted according to the sampling plan contained in the Environmental Compliance Manual (version dated January 31, 1997) Grab samples shall be taken of the ground water only after removal or purging of the equivalent of three casing volumes of standing water from the well bore. For low-yielding wells where this is not possible, evacuation procedures shall conform to the RCRA Ground Water Monitoring Technical Enforcement Guidance Document.

f) Laboratory Approval

All analyses shall be performed by a laboratory certified by the State of Utah according to methods cited in R317-6-6.3L. Detection limits for all parameters except cyanide amenable to chlorination are to be equal or less than the ground water standard, or the ground water protection level, which ever is less in Tables 3 and 4. Within 30 days of the effective date of permit renewal, the permittee shall submit a list of analytical methods used for sample analysis. Other analytical methods shall be used only with permission of the Executive Secretary.

g) Damage to Monitoring Wells. If any monitor well is damaged or is otherwise rendered inadequate for its intended purpose, the Executive Secretary shall be notified within five days in writing.

h) If additional downgradient wells are required, they will be monitored in accordance with the above requirements.

2. Performance Monitoring - No discharge of process fluids from the plant, pads or ponds to ground water is allowed. Maintenance of this performance standard will be demonstrated by monitoring for process fluids in leak detection sumps and lines.

a) Frequency. The leak detection sumps of all operating pads and ponds shall be visually monitored daily during operation for the presence of fluids and the results recorded in a log maintained by the operator.

b) Sampling. Upon detection of fluids in the sumps, samples will be analyzed as soon as possible for the constituents listed in Table 6. For emergency purposes, the analyses may be performed in the company laboratory. If the permittee wishes to demonstrate that the fluids in the sump are not process fluids, an analysis to confirm this must be done at a state-certified laboratory.

Table 6 - Parameters

Parameter

pH
Total Cyanide
Gold

c) Reporting procedures in Part I E.2 must be followed as applicable.

E. REPORTING REQUIREMENTS.

1. Routine Reporting - The permittee shall furnish the Executive Secretary quarterly monitoring reports of compliance monitoring. Reports shall include the following information:

- (a) Reports of analyses of well samples as required in Part I.D.1
- (b) A report of ground water elevations as measured in all monitor wells (except BCG280 and BCG31) within a 6 day period during the quarter covered by the report, and corresponding with the time of sampling. A longer time interval for measuring ground water elevation may be used (with Executive Secretary approval) if the permittee can demonstrate that ground water elevations do not change during the proposed time interval. A summary of the measured depth to water and ground water elevations shall be prepared and submitted with the quarterly report.
- (c) A report on visual inspections of the leak detection systems during the quarter.

Reports shall be submitted according to the schedule in Part II D. Failure to submit the reports by the due date above shall be deemed as non-compliance.

2. Reporting of BAT Failure - The presence of fluids in the leak detection sumps of the two process water ponds built under the March 24, 1989 construction permit or of fluids in the lower sump or fluids in the upper sump in quantities greater than 200 gal/acre/day in the pond built under the August 2, 1995 construction permit is to be reported by telephone within 24 hours of detection to the telephone number provided in Part II and in writing within five days to the Division of Water Quality (DWQ) at the address in Part II D. The written submission shall contain:

- (a) A description of fluids, results of emergency analyses, and as applicable their volume or flow, and duration of failure
- (b) The cause of failure and
- (c) Steps taken or planned to reduce, eliminate or prevent recurrence of the leak
- (d) The permittee shall prepare and submit within 30 days unless waived by the Executive Secretary: (1) a plan and time schedule for assessment of the source, extent and potential dispersion of the contamination, (2) an evaluation of potential remedial action required to restore BAT and to restore and maintain ground water quality, so as to ensure that the Ground Water Quality Standards, will not be exceeded at compliance monitoring points.

3. Out of Compliance Reporting - In the event that the facility becomes out of compliance as defined in Part I.F.2, the reporting schedule in Part I.E.2 above will be implemented.
4. Contingency Plan - In the event of a spill of contaminants which may threaten ground water quality, the permittee shall follow the Spill Prevention, Control and Countermeasures Plan contained in the revised Environmental Compliance Manual dated August 2002, or other plan as approved by the Executive Secretary.

F. OUT OF COMPLIANCE STATUS

Information must be provided to the Executive Secretary if the operation becomes out of compliance. Immediate action is required to identify the problem, report, and repair the facility. Out-of-compliance is defined below:

1. Ground Water Monitoring

Exceedence of the compliance levels (Tables 3 and 4) at any downgradient compliance monitoring well shall constitute noncompliance with this permit according to the following:

- a. Probable Out-of-Compliance Status - If the concentration of a pollutant from any compliance monitoring well exceeds the higher of the protection level or the out-of-compliance level as found in Parts I.B.2 and I.B.3 of this permit, the Permittee shall:
 - i. Notify the Executive Secretary in writing of the probable out-of-compliance status within 30 days of receipt of the initial analytical data.
 - ii. Implement an accelerated schedule of monthly ground water sampling and analysis for parameters requested by the Executive Secretary. This monthly sampling will continue for at least two months or until the compliance status can be determined by the Executive Secretary. Reports of the results of this sampling will be submitted to the Executive Secretary as soon as they are available, but not later than 45 days from each date of sampling.
- b. Out-of-Compliance Status
 - i. Notification and Accelerated Monitoring - upon determination by the permittee, in accordance with UAC R317-6-6.17 and Part I.B.3 that an out-of-compliance status exists, the permittee shall:
 - 1) Verbally notify the Executive Secretary of the out-of-compliance status within 24 hours of verification, and provide written notice within 5 days of the detection, and
 - 2) Immediately implement an accelerated schedule of monthly ground water monitoring which shall continue for at least two months or until the facility is brought into compliance.

ii. Source and Contamination Assessment Study Plan - within 30 days of the verbal notice to the Executive Secretary, the permittee shall submit an assessment study plan and compliance schedule for:

- 1) Assessment of the source or cause of the contamination, and a determination of steps necessary to correct the source.
- 2) Assessment of the extent of the ground water contamination and any potential dispersion.
- 3) Evaluation of potential remedial actions to restore and maintain ground water quality, and ensure that the ground water standards will not be exceeded at the downgradient compliance monitoring wells.

c. Probable Out-of-Compliance for Total Dissolved Solids

In the event that Total Dissolved Solids (TDS) exceeds protection levels in any well and no other parameters exceed protection levels, the permittee shall prepare a report on the cause of the exceedance for submission with the next regular quarterly monitoring report. The report must include information such as an analysis of major ion chemistry in the ground water and process fluids, geographic distribution of ground water chemistry and other factors at the site sufficiently detailed to determine whether the TDS exceedance was due to mining activities or natural variation.

Upon examining the information in the report, if the Executive Secretary determines that the exceedance was due to mining activities, the permittee shall follow the procedures in Parts I.F.1 (a) and (b). Based on available information, the Executive Secretary may require changes in the monitoring plan or changes in mine operations if needed to protect ground water quality.

2. Failure to Maintain Best Available Technology Required by Permit

A verified leak of process fluids beneath the pads or ponds, or an exceedance of the allowable leakage rate (200 gal/acre/day) in the upper sump of the process water pond built under the August 2, 1995 construction permit shall constitute failure of BAT and be a violation of this permit. In the event a compliance action is initiated against the permittee for violation of permit conditions relating to Best Available Technology, the permittee may affirmatively defend against that action by demonstrating the following:

- a. The permittee submitted notification in accordance with R317-6-6.13;
- b. The failure was not intentional or caused by the permittees's negligence, either in action or failure to act;

- c. The permittee has taken adequate measures to meet permit conditions in a timely manner or has submitted for the Executive Secretary's approval, an adequate plan and schedule for meeting permit conditions; and
- d. The provisions of UCA 19-5-107 have not been violated.

G. CLOSURE REQUIREMENTS.

1. The heap leach pads must be reclaimed in such a way that groundwater pollution is prevented. Any ore heap leach closure scenario that envisions the release of contact water to the environment will require that approved water quality criteria be met for three consecutive monthly samples before contact water release can occur. The sampling procedure must be submitted in the closure plan for review and approval. **In no case shall the closure criteria for this heap leach project result in degradation of the surface or ground water quality including beneficial uses thereof in the vicinity.**
2. The oxide waste rock dumps and the sulfide waste rock repositories must be capped in accordance with the approved Waste Rock Management Plan (Appendix A). Any ore remaining in the small sulfide ore stockpile above the crusher at closure must be processed or removed to an approved sulfide repository and capped in accordance with the Waste Rock Management Plan.

A closure document shall be submitted to both the Division of Water Quality and Division of Oil, Gas and Mining for review and approval twelve (12) months prior to the end of the operation of the heap leach pads and will include the following.

- a) An estimation of the potential for post-closure leaching of contaminants from the leach pads and justification for the type of cover or cap placed over them to prevent ground water pollution.
- b) Plans and procedures for pipeline removal and heap leach closure.
- c) Plans for post-closure ground water monitoring.
- d) Copies of any other reclamation or closure plans filed with other agencies.

H. MINE WATER USE.

Water from the mine pits may be used for dust suppression at the Barney's Canyon mine, process operations or piped for use at Kennecott Utah Copper's Copperton Concentrator. The water may not be used or disposed of otherwise without prior approval from the Division of Water Quality. The mine pit water must not be otherwise discharged from company property.

PART II. MONITORING, RECORDING AND REPORTING REQUIREMENTS

- A. REPRESENTATIVE SAMPLING. Samples taken in compliance with the monitoring requirements established under Part I shall be representative of the monitored activity.
- B. ANALYTICAL PROCEDURES. Water sample analysis must be conducted according to test procedures specified under UAC R317-6-6.3.L, unless other test procedures have been specified in this permit.
- C. PENALTIES FOR TAMPERING. The Act provides that any person who falsifies, tampers with, or knowingly renders inaccurate, any monitoring device or method required to be maintained under this permit shall, upon conviction, be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than six months per violation, or by both.
- D. REPORTING OF MONITORING RESULTS. Monitoring results obtained during each quarterly reporting period specified in the permit, shall be submitted to the Executive Secretary, Division of Water Quality at the following address no later than the 15th day of the second month following the completed reporting period:

Attention: Compliance and Monitoring Program
Utah Department of Environmental Quality
Division of Water Quality
State of Utah
Salt Lake City, UT 84114-4870

The due dates for reporting are: May 15, August 15, November 15, and February 15.

- E. COMPLIANCE SCHEDULES. If compliance schedules are included as part of the ground water discharge permit, compliance or noncompliance with interim or final requirements of the schedule shall be submitted no later than 14 days following schedule date for accomplishing the requirement.
- F. ADDITIONAL MONITORING BY THE PERMITTEE. If the permittee monitors any pollutant more frequently than required by this permit, using approved test procedures as specified in this permit, the results of this monitoring shall be included in the calculation and reporting of the data submitted. Such increased frequency shall also be indicated.
- G. RECORDS CONTENTS.
 - 1. Records of monitoring information shall include:
 - a) The date, exact place, and time of sampling or measurements;
 - b) The individual(s) who performed the sampling or measurements;
 - c) The date(s) and time(s) analyses were performed;
 - d) The individual(s) who performed the analyses;
 - e) The analytical techniques or methods used; and,
 - f) The results of such analyses.

- H. **RETENTION OF RECORDS.** The permittee shall retain records of all monitoring information, including all calibration and maintenance records and copies of all reports required by this permit, and records of all data used to complete the application for this permit, for a period of at least five years from the date of the sample, measurement, report or application. This period may be extended by request of the Executive Secretary at any time.
- I. **TWENTY-FOUR HOUR NOTICE OF NON-COMPLIANCE REPORTING.**
1. The permittee shall verbally report any non-compliance which may endanger public health or the environment as soon as possible, but no later than twenty-four (24) hours from the time the permittee first became aware of the circumstances. The report shall be made to the Utah Division of Environmental Quality 24 hour number, (801) 538-6333, or to the Division of Water Quality, Ground Water Protection Section at (801) 538-6146, during normal business hours (8:00 am - 5:00 pm Mountain Time).
 2. A written submission shall also be provided to the Executive Secretary within five days of the time that the permittee becomes aware of the circumstances. The written submission shall contain the information requested in Part I.E.3.
 3. Reports shall be submitted to the addresses in Part II.D, Reporting of Monitoring Results.
- J. **OTHER NON-COMPLIANCE REPORTING.** Instances of non-compliance not required to be reported within 24 hours, shall be reported at the time that monitoring reports for Part II D are submitted.
- K. **INSPECTION AND ENTRY.** The permittee shall allow the Executive Secretary, or an authorized representative, upon the presentation of credentials and other documents as may be required by law, to:
1. Enter upon the permittee's premises where a regulated facility or activity is located or conducted, or where records must be kept under the conditions of the permit;
 2. Have access to and copy, at reasonable times, any records that must be kept under the conditions of this permit;
 3. Inspect at reasonable times any facilities, equipment (including monitoring and control equipment), practices, or operations regulated or required under this permit; and,
 4. Sample or monitor at reasonable times, for the purpose of assuring permit compliance or as otherwise authorized by the Act, any substances or parameters at any location.

PART III. COMPLIANCE RESPONSIBILITIES

- A. **DUTY TO COMPLY.** The permittee must comply with all conditions of this permit. Any permit non-compliance constitutes a violation of the Act and is grounds for enforcement action; for permit termination, revocation and reissuance, or modification; or for denial of a permit renewal application. The permittee shall give advance notice to the Executive Secretary of the Utah State Water Quality Board of any planned changes in the permitted facility or activity which may result in non-compliance with permit requirements.
- B. **PENALTIES FOR VIOLATIONS OF PERMIT CONDITIONS.** The Act provides that any person who violates a permit condition implementing provisions of the Act is subject to a civil penalty not to exceed \$10,000 per day of such violation. Any person who willfully or negligently violates permit conditions is subject to a fine not exceeding \$25,000 per day of violation. Any person convicted under Section 19-5-115 of the Act a second time shall be punished by a fine not exceeding \$50,000 per day. Nothing in this permit shall be construed to relieve the permittee of the civil or criminal penalties for non-compliance.
- C. **NEED TO HALT OR REDUCE ACTIVITY NOT A DEFENSE.** It shall not be a defense for a permittee in an enforcement action that it would have been necessary to halt or reduce the permitted activity in order to maintain compliance with the conditions of this permit.
- D. **DUTY TO MITIGATE.** The permittee shall take all reasonable steps to minimize or prevent any discharge in violation of this permit which has a reasonable likelihood of adversely affecting human health or the environment.
- E. **PROPER OPERATION AND MAINTENANCE.** The permittee shall at all times properly operate and maintain all facilities and systems of treatment and control (and related appurtenances) which are installed or used by the permittee to achieve compliance with the conditions of this permit. Proper operation and maintenance also includes adequate laboratory controls and quality assurance procedures. This provision requires the operation of back-up or auxiliary facilities or similar systems which are installed by a permittee only when the operation is necessary to achieve compliance with the conditions of the permit.
- F. **UNFORESEEN EVENTS.** The conditions of this permit described in Part I.G.2 shall not prohibit the permittee from taking emergency action to prevent the loss of life, personal injury, severe property damage, and to protect public health and the environment.

PART IV. GENERAL REQUIREMENTS

- A. **PLANNED CHANGES.** The permittee shall give notice to the Executive Secretary as soon as possible of any planned physical alterations or additions to the permitted facility. Notice is required when the alteration or addition could significantly change the nature of the facility or increase the quantity of pollutants discharged.
- B. **ANTICIPATED NON-COMPLIANCE.** The permittee shall give advance notice of any planned changes in the permitted facility or activity which may result in non-compliance with permit requirements.
- C. **PERMIT ACTIONS.** This permit may be modified, revoked and reissued, or terminated for cause. The filing of a request by the permittee for a permit modification, revocation and reissuance, or termination, or a notification of planned changes or anticipated non-compliance, does not stay any permit condition.
- D. **DUTY TO REAPPLY.** If the permittee wishes to continue an activity regulated by this permit after the expiration date of this permit, the permittee must apply for and obtain a new permit. The application should be submitted at least 180 days before the expiration date of this permit.
- E. **DUTY TO PROVIDE INFORMATION.** The permittee shall furnish to the Executive Secretary, within a reasonable time, any information which the Executive Secretary may request to determine whether cause exists for modifying, revoking and reissuing, or terminating this permit, or to determine compliance with this permit. The permittee shall also furnish to the Executive Secretary, upon request, copies of records required to be kept by this permit.
- F. **OTHER INFORMATION.** When the permittee becomes aware that it failed to submit any relevant facts in a permit application, or submitted incorrect information in a permit application or any report to the Executive Secretary, it shall promptly submit such facts or information.
- G. **SIGNATORY REQUIREMENTS.** All applications, reports or information submitted to the Executive Secretary shall be signed and certified.
 - 1. All permit applications shall be signed as follows:
 - a) For a corporation: by a responsible corporate officer.
 - b) For a partnership or sole proprietorship: by a general partner or the proprietor, respectively.
 - c) For a municipality, State, Federal, or other public agency: by either a principal executive officer or ranking elected official.² All reports required by the permit and other information requested by the Executive Secretary shall be signed by a person described above or by a duly authorized representative of that person.

A person is a duly authorized representative only if:

- a) The authorization is made in writing by a person described above and submitted to the Executive Secretary, and,
 - b) The authorization specified either an individual or a position having responsibility for the overall operation of the regulated facility or activity, such as the position of plant manager, operator of a well or a well field, superintendent, position of equivalent responsibility, or an individual or position having overall responsibility for environmental matters for the company. (A duly authorized representative may thus be either a named individual or any individual occupying a named position.)
3. Changes to Authorization. If an authorization under Part IV G 2. is no longer accurate because a different individual or position has responsibility for the overall operation of the facility, a new authorization satisfying the requirements of Part IV G 2. must be submitted to the Executive Secretary prior to or together with any reports, information, or applications to be signed by an authorized representative.
4. Certification. Any person signing a document under this section shall make the following certification:

"I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations."

- H. PENALTIES FOR FALSIFICATION OF REPORTS. The Act provides that any person who knowingly makes any false statement, representation, or certification in any record or other document submitted or required to be maintained under this permit, including monitoring reports or reports of compliance or non-compliance shall, upon conviction be punished by a fine of not more than \$10,000 per violation, or by imprisonment for not more than six months per violation, or by both.
- I. AVAILABILITY OF REPORTS. Except for data determined to be confidential by the permittee, all reports prepared in accordance with the terms of this permit shall be available for public inspection at the offices of the Executive Secretary. As required by the Act, permit applications, permits, effluent data, and ground water quality data shall not be considered confidential.

- J. **PROPERTY RIGHTS.** The issuance of this permit does not convey any property rights of any sort, or any exclusive privileges, nor does it authorize any injury to private property or any invasion of personal rights, nor any infringement of federal, state or local laws or regulations.
- K. **SEVERABILITY.** The provisions of this permit are severable, and if any provision of this permit, or the application of any provision of this permit to any circumstance, is held invalid, the application of such provision to other circumstances, and the remainder of this permit, shall not be affected thereby.
- L. **TRANSFERS.** This permit may be automatically transferred to a new permittee if:
1. The current permittee notifies the Executive Secretary at least 30 days in advance of the proposed transfer date;
 2. The notice includes a written agreement between the existing and new permittee containing a specific date for transfer of permit responsibility, coverage, and liability between them; and,
 3. The Executive Secretary does not notify the existing permittee and the proposed new permittee of his or her intent to modify, or revoke and reissue the permit. If this notice is not received, the transfer is effective on the date specified in the agreement mentioned in paragraph 2 above.
- M. **STATE LAWS.** Nothing in this permit shall be construed to preclude the institution of any legal action or relieve the permittee from any responsibilities, liabilities, penalties established pursuant to any applicable state law or regulation under authority preserved by Section 19-5-115 of the Act.
- N. **REOPENER PROVISIONS.** This permit may be reopened and modified (following proper administrative procedures) to include the appropriate limitations and compliance schedule, if necessary, if one or more of the following events occurs:
1. If new ground water standards are adopted by the Board, the permit may be reopened and modified to extend the terms of the permit or to include pollutants covered by new standards. The permittee may apply for a variance under the conditions outlined in R317-6.4(D)
 2. Changes have been determined in background ground water quality.